



# Technical Assistance Services for Communities

## Report on OU4 Pilot Study Results

**Contract No.:** EP-W-13-015

**Task Order No.:** 3 OSRTI – Multi Regions & HQ

**Site Name:** DePue/New Jersey Zinc/Mobil Chemical Corp. Superfund Site  
**Site Location:** DePue, Illinois

### **Purpose**

In April 2014, the DePue Community Advisory Group (CAG) requested a review of the DePue/New Jersey Zinc/Mobil Chemical Corp. Superfund site (the Site) May 2014 Pilot Study Sampling Report by the U.S. Environmental Protection Agency's (EPA's) Technical Assistance Services for Communities (TASC) program. Independent technical and environmental consultants implement the TASC program. The report's contents do not necessarily reflect the policies, actions or positions of EPA. TASC has provided this report to residents of DePue, including members of the DePue Superfund CAG.

### **Site Background**

The Site is located along the north side of the Village of DePue and includes about half of the Village's land area. The cleanup has been divided into five operable units (OUs) for investigation and remediation:

- OU1: South Ditch Contaminated Sediments
- OU2: Phosphogypsum Stack
- OU3: Former Plant Site Area
- OU4: Off-site Soils
- OU5: DePue Lake Sediments and the Flood Plain

A Design Study for the investigation, remediation and restoration of contaminated properties in OU4 is underway. The OU4 Design Study proposes “bright-line” cleanup goals for site-related chemicals of potential concern (COPCs).

Prior to finalizing the Design Study, the potentially responsible parties (PRPs) conducted a Pilot Study of a subset of residential properties to better inform the Design Study. The goals of the Pilot Study are to:

- Obtain additional soil data to focus the full-scale soil investigation program.
- Determine the generalized depth of potential plant-related material.
- Determine if the lead concentration in the fine soil fraction is different from the lead concentration in the total sample.

- Determine if concentrations in the 0- to 1-inch soil samples are similar to concentrations in the 1- to 6-inch sample, thereby eliminating the need for collection of the 0- to 1-inch sample during implementation of the Design Study. If the data allow for eliminating the 0- to 1-inch sample interval, future sampling will be conducted from 0 to 6 inches.
- Determine the ability to refine the list of Human Health Constituents of Potential Concern (HCOPCs).
- Determine if chromium is present in the hexavalent or trivalent forms.
- Determine the adequacy of X-ray fluorescence (XRF) technology and define the terms of its use during implementation of the Design Study.
- Understand the likely scope of the full-scale soil remediation program.
- Gain experience with working in the community.
- Evaluate the practicality of the assumptions and plans outlined in the Design Study.

## **General Comments**

1. The Pilot Study Sampling Report assumes that the reader is familiar with the work plan. However, it would be helpful to include some key statements from the work plan in the Pilot Study Sampling Report. For example:
  - The OU4 Study Area has been divided into five subareas (i.e., Northeast Subarea, Northwest Subarea, West Subarea, South Subarea and East Subarea), but the Northeast Subarea was not sampled and no explanation for this is provided in the Pilot Study Sampling Report.
    - According to the work plan, the Northeast Subarea was not included in the study because it mainly includes agricultural and forested land. It is unclear if this subarea will be sampled later as part of the full-scale sampling in support of future use of this area.
  - A checklist was prepared for each property, but the purpose of this checklist is not clear as it relates to the sampling conducted as part of the Pilot Study.
    - According to the work plan, the checklist was completed prior to sampling to gain an understanding of the physical conditions of the home and the property.
2. The Pilot Study Sampling Report does not include a discussion of two significant objectives of the pilot study:
  - Understand the likely scope of the full-scale soil remediation program.
  - Evaluate the practicality of the assumptions and plans outlined in the Design Study.

To provide background information for the reader and context for next steps, TASC suggests that the report provide more extensive discussion on the implications of the Pilot Study results on the Design Study and the full-scale remediation program.

3. The Pilot Study Sampling Report states that arsenic and lead, and possibly cadmium, are the contaminants expected to drive potential remedial action. The cleanup levels for arsenic and lead have not been agreed on and therefore remain the significant community

concern for the OU4 cleanup. TASC recommends the CAG continue to pursue its preferred cleanup goals for lead and arsenic in residential soils as they have not yet been decided.

## Specific Comments

1. **Section 2.4.3 Fine Fraction Lead Samples, Page 3:** This section and a similar section in the work plan (Section 2.5) state that fine fraction samples are collected to “evaluate if the lead concentration in the fine soil fraction is more representative of potential exposure to lead in soil from ingestion.” TASC suggests that the report explain that EPA guidance recommends measuring the fine fraction because smaller particles are more representative of the particle size children are exposed to from inadvertently ingesting lead in soil and dust that adheres to their hands.
2. **Section 2.4.4 Hexavalent Chromium Evaluation Samples, Page 7:** This section does not address the results of the seven samples collected from OU4 to evaluate if the OU4 soil results from the removal investigation are consistent with the sample results from OU3. This sampling activity was identified in the work plan (Section 2.6.4), but not discussed in Section 2.4.4 or Section 3.5 of the Pilot Study report. To clarify whether the OU4 soil results are consistent with the samples from OU3, TASC suggests that this analysis either be summarized in the Pilot Study or that an explanation be provided on why this activity was not completed, if applicable.
3. **Section 3.1 Property Summary and Comparison of Laboratory Data with Screening Criteria, Page 12:** This section states that it summarizes the results of the validated laboratory data compared to screening criteria for residential properties, screening criteria for gardens, and EPA residential regional Removal Management Levels (RMLs). However, the subsections for each subarea (Section 3.1.1 to 3.1.4) only provide a description of each of the 41 properties sampled and do not state if any of the screening levels were exceeded. Section 3.1.5 provides a very brief overview of the screening results; however, it is so general that it does not provide useful information to the public. For example, this section states that arsenic, cadmium, cobalt, iron, lead and manganese were detected at concentrations greater than screening levels in at least one sample location. Such a statement does not provide any insights or perspective on patterns observed by subarea (e.g., Northwest, West, South and East), type of quadrant sampled (e.g., back yard, front yard, side yard, garden, downspouts, drip zone), or what sample depth intervals included most of the exceedances.

Further, because the RMLs are not conservative screening numbers, TASC suggests that a separate discussion be included on how many of the 41 residences exceeded the RMLs versus the other screening criteria. An additional table would be useful to succinctly summarize the information in Tables 3-1 to 3-41, including the residences sampled by subarea and what was found in what location. A possible example is presented below.

### Summary of Screening Comparisons for the 41 residences

Subarea	Residential Area	Yard/Quadrant		Garden		Downspout		Drip Zone		Bare Area	
		SS	SB	SS	SB	SS	SB	SS	SB	SS	SB
South	#18	A	A, <i>L</i>								
	#19		A						A		
	#20	A, C, <i>L</i>	A							A, C	A, C, <i>L</i>
West											
etc...											

Notes: SS = surface soil 0-1 inches SB = > 1 inch

A = arsenic, C = cadmium, L = Lead

***Bold*** = exceeds residential screening level and RML

- Section 3.2 Evaluation of Sampling Intervals, Page 35:** The conceptual site model states that the primary sources of contamination in OU4 are the site-related material that may have been used as fill material and the emissions from historical site operations. A specific objective of the Pilot Study is to determine if concentrations in the 0- to 1-inch soil samples are similar to concentrations in the 1- to 6-inch sample, thereby eliminating the need for collection of the 0- to 1-inch sample during implementation of the final Design Study. If the data allow for elimination of the 0- to 1-inch sample interval, future sampling will be conducted from 0 to 6 inches. Such an approach is allowable under EPA guidance. However, EPA guidance specifically questions the appropriateness of this approach at smelter sites where emissions are a source of contamination, due to an increased likelihood of higher concentrations in the 0- to 1-inch interval.

The Pilot Study Sampling Report states “results clearly show that when all of the data is combined the mean concentrations in the deep soil horizon is either greater than or comparable to the mean concentrations in the shallow horizon. This is also generally true for the three subareas” and recommends that future sampling efforts eliminate the 0- to 1-inch interval and collect samples from the 0- to 6-inch interval.

TASC suggests that further discussion or assessment of OU4 subareas be added to determine whether adequate sampling has been completed in the higher risk subareas in relation to historic plant emissions.

- Section 4.1 Pilot Study Summary, Page 43:** This section does not provide any summary of trends (or lack thereof) for the garden areas and bare areas. Because these areas are addressed separately in the screening result tables (Tables 3-1 to 3-41), any observations that are unique to these areas would be useful for future recommendations on the Design Study. For example, some of the highest lead concentrations were detected in garden samples, with a maximum observed as high as 2,090 milligrams per kilogram (mg/kg); three other garden samples were well above the garden screening criteria for lead of 400 mg/kg, as shown below.

Subarea	Residential Area	Garden Sample	Lead in Soil (mg/kg)	Depth (inches)	Study Table
West	SS-48	OU4SS4802(18-24)	2,090	18-24	Table 3-31
	SS-36	OU4SS3604(6-12)	750*	6-12	Table 3-19
East	SS-29	OU4SS2901(12-18)	1,830*	12-18	Table 3-12
	SS-46	OU4SS4603(0-6)	795*	0-6	Table 3-29
Note: * Sample is not highlighted in the sampling report as a sample that exceeds the residential screening level for lead of 400 mg/kg.					

6. **Section 4.1 Pilot Study Summary, Page 44:** This section does not explain how the conclusions from the fine fraction lead evaluation will affect the full-scale soil remediation program. It concludes that “the relationship between the lead concentration in the fine and total soil fractions is not sufficiently uniform to support using either the average enrichment ratio or a regression fit to estimate the lead concentration in the fine fraction;” however, it is unclear how this conclusion will be applied to future studies. TASC suggests that this be clarified in the Pilot Study.
7. **Section 4.2 Recommendations for OU4 Design Study, Page 44:** The last bullet of this section recommends that the XRF technology be limited to lead, zinc and copper analysis; this is not consistent with Sections 3.6 and 4.1, which state that XRF during future studies is appropriate for lead, but does not mention zinc or copper. To promote clarity, TASC suggests that this discrepancy be addressed.
8. **Section 4.2 Recommendations for OU4 Design Study, Page 44:** Section 4.2 does not explain how all the conclusions of the Pilot Study for each sampling objective impact the Design Study and the full-scale soil remediation program. For example, the conclusions of the Pilot Study do not address:
  - a. How do the results of the fine-fraction analysis impact full-scale soil remediation?
  - b. Will the full-scale soil remediation program address a subset of COPCs or will it continue to include antimony, arsenic, barium, cadmium, total chromium, cobalt, copper, iron, lead, manganese, mercury, thallium and zinc?
  - c. How has the Pilot Study evaluated the practicality of the assumptions and plans outlined in the Design Study?
  - d. How has the Pilot Study identified the likely scope of the full-scale remediation program?

TASC suggests that the report further explain the possible implications of Pilot Study findings on the OU4 Design Study and full-scale remediation program.



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